Remarks

Overview

Claims 1-14 are currently pending in the application. Claims 1-14 stand rejected. Claims 15-20 have been added.

Claim Status and Amendments

Claims 6, 7 and 8 have been amended to reflect their proper dependencies and claim 12 has been amended to correct improper antecedent basis. New claims 16-20 have been added. Support for the amendments can be found throughout the specification as originally field. As such, claims 1-20 are now presented for the Examiner's consideration.

Objections Under 35 USC § 112

The Examiner objects to claim 6 as being a multiple dependant claim that depends on claims 2, 3, or 4, and is improperly preceded by claim 5. Applicants have amended the claims such that claim 6 depends from 5 and new claims 15 depends from claim 2 and new claim 18 depends from claim 3.

The Examiner objects to claims 7 and 8 because they improperly depend on claim 5. Applicants have amended the claims such that claims 7 and 8 depend upon 6.

The Examiner objects to claim 10 as being indefinite for reciting that the orthogonal fluxes are generated in "substantially" all of the magnetic core. Applicants submit that the term "substantially" is not indefinite as used in this context. MPEP § 2173.05(b)(D) notes that the term substantially may be definite when viewed in light of the specification or by one of ordinary skill in the art. Since a magnetic core is a physical object, with defined boundaries, reciting that the fluxes are generated in "substantially" all of the magnetic core is not indefinite; a person of skill in the art would know what "substantially" means in this instance. Applicants therefore respectfully request reconsideration of this objection.

The Examiner objects to claim 12 because the limitation of "a first phase" has no antecedent basis. Applicants have amended claim 12 to address this objection. Therefore, Applicants respectfully request that this rejection be withdrawn.

The Cited References Fail to Teach or Suggest the Invention

The Examiner rejects claims 1-14 under 35 U.S.C. 103(a) as being unpatentable over McClain et al (U.S. Patent No. 4,288,737) (hereinafter McClain) in view of Roberge et al (U.S. Patent No. 4,393,157) (hereinafter Roberge). Neither of these references, alone or together, teaches all of the elements required by claim 1 or claim 11.

As claimed, impedance regulation is performed by means of orthogonal magnetic fields. In contrast, McClain discloses parallel fields. Regulation by orthogonal fields, as claimed, is swift and effective. That is, it requires less material for performing regulation than regulation by parallel fields.

McClain teaches a voltage regulation system that includes separately adjustable variable impedance elements provided by saturable core reactors. These reactors include a DC control winding such that the current is varied in response to the existing load voltage. However, the Examiner admits that McClain does not disclose orthogonal axes. (See page 4 of the Office action mailed on May 25, 2006).

Roberge teaches a device that includes two orthogonal members M and N (see figure 1) and an arrangement of windings to create orthogonal fluxes. However, the fluxes are created only in a limited volume of the device. This volume corresponds to the intersection of the members. The effectiveness of the regulation, that is, how much the device's impedance varies with the control current, depends on the volume of magnetizable material involved in the process. The Roberge device, because the fluxes are in a limited volume of the device, cannot provide sufficient regulation for use in regulation of line voltages. Thus, Roberge fails to teach the claimed invention.

The Examiner admits that McClain and Roberge do not disclose all the elements of claim 1. The Examiner states that it is inherent that since the first and second axes are orthogonal that any fluxes would be orthogonal. However, it is not obvious that windings having orthogonal axes will create orthogonal fluxes in a magnetic structure. One can have a magnetic structure formed as an L with one winding on each leg of the L such that the magnetic fields follow the L and are substantially parallel inside the core. Furthermore, in Roberge, orthogonal fields are created in a limited part of the magnetic core. Roberge does not show any device where

orthogonal fields are created in substantially the entire core, as required by the claimed invention.

Not only do McClain and Roberge fail to meet the express limitations of the pending claims, but there is also no motivation to combine the two references. The Office action fails to point out and Applicants fail to find any suggestion or motivation in McClain or Roberge to combine these references.

There is no clear motivation in the references for replacing the variable impedance used in McClain with the device shown in Roberge. This would lead to use of a large impedance device to perform the necessary regulation. Such a combination will not result in a regulation range that will be satisfactory to one practicing the technology.

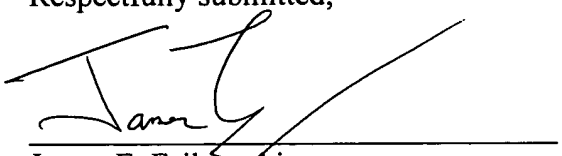
Furthermore, a person of ordinary skill in the art would not combine the devices in McClain and Roberge to obtain regulation of transmission lines because such a device would be exceedingly large and would have a very low efficiency. Further, there is no suggestion in Roberge for replacing the core in the variable impedance device with a core as claimed.

Additionally, Applicants' own invention cannot be used to supply the motivation for combining prior art references. Applicants submit that the examiner is applying *hindsight* as supplied by the *Applicants' own invention*, to supply the motivation for combining references. As stated in MPEP §2143.01, "The mere fact that references can be combined or modified does not render the resultant combination obvious unless the prior art also suggests the desirability of the combination." In re Mills, 916 F.2d 680, 16 USPQ 1430 (Fed. Cir. 1990). As that section further states, "Although a prior art device 'may be capable of being modified to run the way the apparatus is claimed, there must be a suggestion or motivation in the reference to do so.'" In re Mills, 916 F.2d at 682. See also In re Fritch, 972 F.2d 1260, 23 USPQ2d 1780 (Fed. Cir. 1992).

Because claim 2-10 and 15-20 depend on claim 1, those claims are patentable over McClain and Roberge for the same reasons as claim 1. Additionally, since the Office action makes the same arguments with respect to claim 11 as made with respect to claim 1, claim 11 is patentable over McClain and Roberge for the same reasons as claim 1. Since claim 11 is patentable, claims 12-14, which are dependant upon claim 11 are also patentable.

Applicants respectfully submit that the foregoing arguments overcome the Examiner's rejections and that the pending claims are in condition for allowance. The Examiner is invited to contact Applicants' undersigned representative by telephone at the number listed below to discuss any outstanding issues.

Respectfully submitted,



Date: September 25, 2006
Reg. No. 54,089

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